

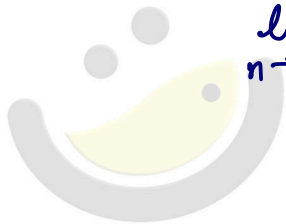
Preparation for CSIR NET | IIT JAM | GATE

Limit of Sequence: Short Trick

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{x}{n}\right)^n = e^x \quad x \in \mathbb{R}.$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{x}{n^2}\right)^{n^2} = e^x$$



OMG! MATHS }
The glory of logical ideas.

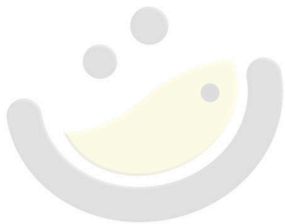
$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

(a) e

(c) e^{-2}

(b) $\frac{1}{e}$

(d) e^2



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The poetry of logical ideas.

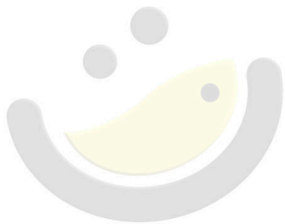
$$\lim_{n \rightarrow \infty} \left(1 + \frac{29}{n}\right)^n$$

(a) e

(c) e^{-1}

~~(b) e^2~~

(d) e^{-2}



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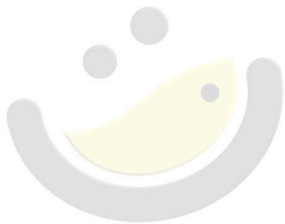
$$\lim_{n \rightarrow \infty} \left(1 + \frac{100}{n}\right)^n$$

~~(a)~~ e^{100}

(c) e^2

(b) e^{10}

(d) $1/e$



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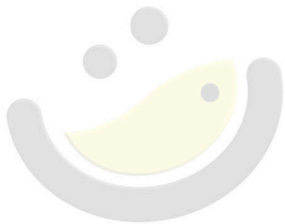
Q $\lim_{n \rightarrow \infty} \left(1 - \frac{50}{n}\right)^n$

(a) e^{-50}

(c) e^{-n}

(b) e^{-100}

(d) e^{-50n}



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$$\lim_{n \rightarrow \infty} \left(1 - \frac{1}{n^2}\right)^n$$

~~(a)~~ 1

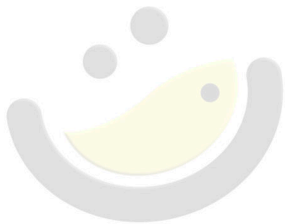
(c) $e^{-1/2}$

(b) e^{-2}

(d) e^{-1}

$$\lim_{n \rightarrow \infty} \left[\left(1 - \frac{1}{n^2}\right)^{n^2} \right]^{1/n}$$

$$\lim_{n \rightarrow \infty} (e^{-1})^{1/n} = (e^{-1})^0 = 1.$$



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